

REMARKS

Claim Amendments

Applicants have amended claims 1, 4-6, 8-10, 12, 15, 37-39, and 42, and previously withdrawn claims 16-36, as indicated below.

Rejections Under 35 U.S.C. § 112, para. 3 – Indefiniteness

In response to the office action of October 2, 2006, claims 12 and 42 have been amended to recited proper Markush groups for the heat source and core plate/manifold material, respectively. Claim 38 has been amended to clarify the language, replacing “configured to contact” with “in contact with”.

In addition, claim 1 has been amended to add the element of an output (previously an element in original claim 8), for which support is found in Figure 14A and in original claim 8, among other places, as well as throughout the application.

Also, some claims have been amended for consistency with language used in the specification and in other claims, to ensure only a single term is recited for the same concept. Thus, for example, claims 1, 4-6, 37 and 39 have been amended to replace “vaporizer” with “evaporator”; claims 1, 12 and 15 have been amended to replace “vapor” pump with “liquid ring” pump; claim 8 has been amended to replace “condensed” liquid product with “distilled” liquid product; and claims 9 and 10 have been amended to replace “intake” with “input”. Other claims have been amended for clarity. Thus, claim 38 has been amended to replace “includes” with “has” and to replace “configured to contact” with “in contact with”, and claim 42 has been amended to say the core plates and manifolding “are” made of, rather than “may be” made of, and to delete the term “for example”.

Still other claims have been amended to ensure proper antecedent basis throughout the claims. Thus, for example, claim 5 has been amended to describe a plurality of parallel evaporator tubes, providing the antecedent basis for reference to evaporator tubes in later dependent claim 6, and claim 8 has been amended to refer to recycling “a blowdown stream” as opposed to “*the* blowdown stream”, for which there was no antecedent basis. Support for these amendments is found throughout the application and examples, in the original claims, and in the figures. In light of the claim amendments, Applicants respectfully submit that all claims are

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definite and meet the requirement of 35 USC § 112, para. 2, and so request withdrawal of the indefiniteness rejections.

Non-Statutory Obviousness-Type Double-Patenting

Applicants will file the necessary Terminal Disclaimer with respect to U.S. Application Serial No. 10/713,617 at the time any claim is indicated as allowable.

Rejections Under 35 U.S.C. § 103 (a) – Obviousness

Claims 1-8, 10-13, 15 and 37-42 stand rejected as being obvious in view of Mugele (US5,169,502) or Keller (US3,807,912) when combined with Kraner (US6,497,555). Claim 9 is rejected as being obvious in view of Mugele or Keller with Kraner, in further view of Trusch (US4,316,774) or Kikkawa (US4,437,933). Claim 14 is rejected as being obvious in view of Mugele or Keller with Kraner, in further view of Sneedden (US3,603,082) or Straka (US5,761,903).

In all cases, the obviousness rejections rely on the base references of Mugele or Keller combined with Kraner. However, the base references are not sufficient, even when combined with Kraner, to support a *prima facie* case of obviousness. Mugele is directed to “An installation for processing liquids ... under a vacuum....” See Abstract and throughout patent. The Mugele patent discloses a vaporizer **1**, a compressor **11**, a condenser **6**, a vacuum pump **5**, and a downstream preparation system **10** (see Fig. 1, and col. 2-3). Moreover, the installation is a continuous loop for optimizing heat exchange from exhaust gases that have been vaporized from process liquid, after which the condensed process liquid is recycled back to the vaporizer for re-vaporization, and on and on. The installation never distills or purifies a final liquid product from a starting liquid product, and importantly, the installation runs under vacuum and includes a distinct vacuum pump. In Mugele, the compressor comprises a gas-ring pump connected to a vacuum pump downstream, to enhance vaporization of the process liquid and optimize heat exchange (see Figs. 2-3, and discussion at col. 3). The system is not a liquid purification system. The installation merely recycles liquid through the installation without a purification or distillation process, and without collection of a purified/distilled liquid product (see Mugele, discussion at p. 2, line 67 through line 5 of col. 3 – “The vapors that have been compressed to at least atmospheric pressure by the vacuum pump **5** are recovered by a downstream preparation

system **10** and reused as process liquid” –, and claim 1, final step – “means for returning the process liquid from said condenser to said vaporizer”).

The combination of Mugele and Kraner does not teach all the claim limitations of the instant invention. Namely, the claims 1 and recites an input, an evaporator, a head chamber, a liquid ring pump, an electric motor, a condenser, and *an output for collection of distilled liquid product and a liquid waste output*. In contrast, the combination of Mugele and Kraner fails to teach the output for collection of distilled liquid product or the liquid waste output.

With respect to the obviousness rejection based on Keller as the primary reference, Keller (US3,807,912) is not proper as a primary reference, because, while at a glance Keller appears to disclose a liquid ring pump useful for purifying liquids in a distillation system comprising an evaporator and condenser as claimed in the instant invention, Keller in fact discloses hydraulic pumps and hydraulic motors (see e.g. Keller, col. 1, lines 49-53, 59-61 and 64-65; col. 2; col. 6; col. 7-8; and col. 10, line 56 through col. 11, line 10), devices incompatible with a liquid distillation system. As those skilled in the art understand, hydraulic pumps and hydraulic motors do not involve the phase changes required in distillation from liquid to vapor and then back to liquid. More importantly, a phase change *cannot* occur, or the hydraulic pump would lose its singular advantage of providing a large force as a result of a pressure differential that arises when pressurized fluid flows through the rotating pump and is compressed in the spaces between the pump vanes as the pump rotates. Thus, Keller teaches away from the central concepts of a distillation system.

As well, the hydraulic pumps disclosed in Keller have a control device which can move the rotor shaft that drives rotation of the pump assembly and vanes, relative to the central axis of the vanes, such that if the rotor shaft is off-set to one side of the vanes’ central axis, the pump (and fluid) will rotate clock-wise; if positioned in-line with the central axis of the vanes, the pump will rotate, but no fluid will flow; and if the rotor shaft is off-set to the other side of the vanes’ central axis, the pump (and fluid) will rotate counter-clockwise. Thus, the rotation of the pump, and fluid flowing through it, is fully reversible.

In contrast, the presently claimed liquid distillation system recites elements that allow input of a liquid, vaporization of that liquid, condensation of the vapor to a distilled liquid product, and then collection of the purified distilled liquid product via an output for a distinct end use of the purified product. The system claimed herein does not constitute a closed loop,

wherein the process liquid back to the vaporizer, as in Mugele; rather, the system as claimed constitutes a linear process from untreated liquid in to distilled liquid product out. Stated again, the system of the instantly claimed invention adds new liquid for purification as product liquid is removed, it does not constitute a continuous loop of recycled liquid never utilized as a purified product.

And, in contrast to Keller, the presently claimed liquid distillation system is a liquid distillation system that involves liquid changing from liquid, to vapor, and back to purified liquid as it flows through the distillation system. Conversely, Keller discloses a hydraulic system designed to direct liquid under pressure through a rotary pump assembly to create a pressure differential and thus a high force for driving some mechanical, or other, device requiring a large force for operation (such as driving the wheels on landing gear of a jet to achieve runway speed, or assisting in braking an aircraft during landing, for example – see Keller, col. 8, lines 47-60). Moreover, the liquid distillation system and liquid ring pump claimed herein has an internal drive/rotor shaft, so it is fixed with respect to the rotating vanes assembly and flow is not reversible, whereas the hydraulic fluid flow devices disclosed in Keller have a movable rotor shaft and so a reversible flow.

Keller, combined with Kraner, which discloses a motor assembly coupled to a liquid ring pump, does not teach all the claimed limitations because neither Keller nor Kraner discloses a vaporizer and a condenser, or a heat exchanger (see claim 11), let alone an evaporator that has a plurality of parallel core layers with rib sections that create channels for directing steam and condensed liquid flow (see claim 39). Moreover, one would not modify Keller from a hydraulic system to a liquid distillation system comprising an evaporator and a condenser, because such a modification would render Keller unsuitable for its intended purpose – providing hydraulic force to perform a mechanical task.

As stated in MPEP 2143.01 “If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification” citing *In re Gordon*, 733 F.2d 900 (Fed.Cir. 1984). In the present case, the intended purpose of Keller is to provide a “fluid flow device having reversible infinitely variable flow.. useful for accelerating, sustained movement, or braking” (see Keller, Abstract and throughout). Modifying Keller to a distillation system means the fluid flow device of Keller would no longer be a hydraulic fluid flow device capable of doing

mechanical work, and so would render Keller unsuitable for its intended purpose. Thus, there is no motivation to combine Keller with Kraner, because neither the references themselves, nor the prior art as a whole suggest the combination of references proposed by the Examiner. And as held in *Ruiz v. A.B. Chance Co.*, (234 F.3d 654,665-66 (Fed.Cir. 2000), emphasis added.) “References may be combined *only* if the prior art provides some motivation or suggestion to one of ordinary skill in the art to make such a combination....”

Finally, Keller teaches away from the presently claimed invention, because combining a hydraulic pump with a liquid ring pump and modifying said combination to arrive a liquid distillation system would defeat the essential purpose of Keller – creating a pressure differential as pressurized fluid flows through the hydraulic pump rotating vanes, and thus producing a large force for driving a mechanical device in need of such a large force. And as stated in MPEP § 2145 X. D. 2 “It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983).” As detailed in MPEP § 2142, three criteria must be met to support a *prima facie* case of obviousness - motivation/suggestion to modify or combine reference teachings; reasonable expectation of success; and all claim limitations must be taught/suggested by cited reference(s) - paraphrased from *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). In the present case, there is no *prima facie* case of obviousness because the primary reference combinations cited to support a *prima facie* case of obviousness are flawed. The combination of Mugele with Kraner does not teach all the claim limitations of claim 1 and those claims which depend therefrom, and does not suggest modifications to arrive at the claim limitations. More problematically, there is no suggestion or motivation to combine Keller with Kraner because (a) the combination would render Keller unsuitable for its intended purpose, (b) Keller teaches away from the claimed liquid distillation system, and (c) Keller with Kramer does not teach or suggest all the claimed limitations recited in claim 1.


The secondary references add nothing to the primary reference combinations of Mugele with Kraner or Keller with Kraner with respect to teaching or suggesting the limitations of claim 1, and do not overcome the lack of motivation to combine Keller with Kraner.

CONCLUSION

For at least the reasons set forth above, Applicants respectfully submit that the claims, as herein amended, are definite and meet the requirements of 35 U.S.C. § 112, para. 2, that the claims are non-obvious and meet the requirements of 35 U.S.C. §103(a), and that the three criteria for a *prima facie case* of obviousness have not been met with respect to the cited primary references. Withdrawal of the obviousness rejections and an early notice of allowance is therefore respectfully requested.

It is believed that a two-month extension fee is required; however, if any additional extension fees are required for the timely consideration of this application, please charge deposit account number 19-4972. The Examiner is requested to telephone the undersigned if any matters remain outstanding so that they may be resolved expeditiously.

Respectfully submitted,


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